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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CADUGAN, ERICA E	
ART UNIT	PAPER NUMBER
3722	4

DATE MAILED: 08/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/071,596	MEECE ET AL.	
	Examiner	Art Unit	
	Erica E Cadugan	3722	

-- The MAILING DATE of this communication appears on the cov r she t with the correspond nc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 February 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disp sition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 February 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. Figure 7 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 7 and 11-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Specifically, claims 7 and 11 set forth the limitation "controlling the rate of advance such that the hole remains substantially a flat-bottomed hole as it is cut". This language is repeated in the specification on page 3, paragraph 8, last sentence. However, the specification does not describe what is meant by this limitation, i.e., does not describe what constitutes such a rate of advance, nor what constitutes a "substantially a flat bottomed hole".

Note that for the hole to be cut as claimed, the tool must advance through the workpiece, and thus as it advances, there are at least some times in the machining process wherein the hole

is not going to be completely flat-bottomed. For example, note that in orbital machining of a hole in general, inherently either the tool has to be used to machine the hole at one depth, then advanced, then used to machine the hole at a slightly deeper depth, or the tool has to be constantly advancing while orbiting, thus producing a spiral tool path. In any case, Applicant has not specified either method, and neither method allows for the hole to be constantly flat-bottomed during the cutting process. Also, in general in machining of the type described by Applicant, tools are not used to remove extremely large amounts of material at one time, i.e., are not fed to an extremely large depth into a workpiece for a single cut (see Tool and Manufacturing Engineers Handbook, Vol. 1, Machining, pp.10-50 through 10-61 and 12-144), and it is unclear from Applicant's specification what degree of feed produces a hole that remains "substantially flat-bottomed", since it would appear that variations from true flat in the hole bottom as the hole is machined due to typical feeding (described by Tool and Manufacturing Engineers Handbook, Vol. 1, Machining)of the tool would produce a "substantially flat-bottomed" hole, i.e., varying by no more that a few thousandths of an inch at any given time during the process.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 7 and 11-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. The term "substantially a flat-bottomed hole" in claims 7 and 11 is a relative term which renders the claim indefinite. The term "substantially a flat-bottomed hole" is not defined by the

claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. See the above 112, first paragraph rejection of these claims for a more detailed explanation of why this limitation is an unclear relative term in the context of this application.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 8, and 10 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by any of U.S. Pat. No.'s 5,934,847 (Thelin, hereinafter, '847), 5,816,755 (Thelin, hereinafter '755), 5,641,252 (Eriksson et al., hereinafter '252), 5,685,674 (Taquist et al.), or WO 94/17944 (hereinafter '944).

All of the above references teach orbital machining of a through-hole in a composite material utilizing a cylindrical tool smaller than the finished hole diameter.

For '847, see Figures 1A and 1B and col. 2, lines 13-15, for example.

For '755, see Figures 1A and 1B and col. 1, lines 31-33, for example.

For '252, see Figure 1C and col. 1, lines 14-35 and col. 4, lines 23-42, for example.

For Taquist et al., see Figure 3 and col. 1, lines 31-40 and col. 2, lines 58-62, for example.

Regarding '944, see page 1, lines 1-7, page 4, lines 24-26, page 7, lines 19-25, and Figures 1-3, for example.

9. Claims 1, 8, and 9 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by any of U.S. Pat. No.'s 6,007,281 (Eriksson et al., hereinafter '281) or 5,641,252 (Eriksson et al., hereinafter, '252).

Each of the above references teach orbital machining of a blind-hole in a composite material utilizing a cylindrical tool smaller than the finished hole diameter.

For '281, see Figures 5-6, col. 8, lines 29-34, col. 4, lines 9-11, and particularly regarding claim 9, see col. 6, lines 31-33, for example.

For '252, see Figure 1C and col. 1, lines 14-35 and col. 4, lines 23-42, for example. Specifically regarding claim 9, see Figure 1D.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of U.S. Pat. No.'s 5,934,847 (Thelin, hereinafter, '847), 5,816,755 (Thelin, hereinafter '755), 5,685,674 (Taquist et al.), 6,007,281 (Eriksson et al., hereinafter '281) or 5,641,252 (Eriksson et al., hereinafter, '252)or WO 94/17944 (hereinafter '944) as applied to claim 1 above.

Each of '847, '755, Taquist et al., '281, '252, and '944 teaches all aspects of the claimed invention as described in the above rejection based thereon, but does not specifically teach that the composite material is a "ceramic matrix composite material", nor that the composite material is a "silicon carbide/silicon carbide composite material".

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the composite material taught by each of the described references whatever type of composite material, such as "ceramic matrix" or "silicon carbide/silicon carbide" as was desired or expedient to an end user, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, particularly since Applicant has not ascribed any particular criticality to the use of a "ceramic matrix" composite, or to a "silicon carbide/silicon carbide" composite (see page 2, paragraph 6, which states that the "approach may be used with a wide variety of composite materials", for example). In re Leshin, 125 USPQ 416. See also Ballas Liquidating Co. v. Allied industries of Kansas, Inc. (DC Kans) 205 USPQ 331.

12. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of U.S. Pat. No.'s 5,934,847 (Thelin, hereinafter, '847), 5,816,755 (Thelin, hereinafter '755), 5,685,674 (Taquist et al.), 6,007,281 (Eriksson et al., hereinafter '281) or 5,641,252 (Eriksson et al., hereinafter, '252)or WO 94/17944 (hereinafter '944) as applied to claim 1 above, and further in view of German Patent Document 19920365 A1 (hereinafter '365).

Each of '847, '755, Taquist et al., '281, '252, and '944 teaches all aspects of the claimed invention as described in the above rejection based thereon, but each of these references is silent as to how the workpiece is held for machining.

'365 teaches a holding device for a workpiece (see Figures 1-2, for example), wherein a thermosetting adhesive is used to affix the workpiece to a carrier, and where the workpiece is removed from the carrier upon completion of the machining (see abstract). Additionally, '365

teaches that such holding serves to hold a workpiece "precisely in registration on a carrier for machining or other precision operations, afterwards separating them", and further teaches that such holding "avoids all form of surface damage or impairment", see abstract, for example.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the thermosetting adhesive device and method taught by '365 to hold the workpieces taught by any of '847, '755, Taquist et al., '281, '252, and '944 for the purposes of holding the workpieces precisely in registration, thereby increasing the machining accuracy, and for providing a holding technique that "avoids all form of surface damage or impairment", as taught by '365.

13. Claim 7, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over any of U.S. Pat. No.'s 5,934,847 (Thelin, hereinafter, '847), 5,816,755 (Thelin, hereinafter '755), 5,685,674 (Taquist et al.), 6,007,281 (Eriksson et al., hereinafter '281) or 5,641,252 (Eriksson et al., hereinafter, '252)or WO 94/17944 (hereinafter '944) as applied to claim 1 above and further in view of the teachings of Tool and Manufacturing Engineers Handbook, Vol. 1, Machining, pp. 10-50 through 10-61 and 12-144.

Each of '847, '755, Taquist et al., '281, '252, and '944 teaches all aspects of the claimed invention as described in the above rejection based thereon, but each of these references is silent as to the particular rate of longitudinal advance of the cutter.

However, as evidenced by the teachings of Tool and Manufacturing Engineers Handbook, Vol. 1, Machining, the longitudinal feed rate in a milling operation is selected based on a number of factors, such as the material being cut and the available power of the milling machine (see page 10-16, for example). Additionally, Tool and Manufacturing Engineers

Handbook, Vol. 1, Machining teaches that in general "lower feeds are needed for cutting harder materials" (page 10-60), and provides various feed rates to try with various materials, see Table 10-8. Noting that all of the feed rates listed would create an advance of the tool wherein the tool is only advanced at most a few thousandths of an inch at a time, which would appear, as best understood, to create a hole that remains "substantially flat-bottomed" as cut.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized one of the specific "lower feeds" taught by the teachings of Tool and Manufacturing Engineers Handbook, Vol. 1, Machining, to machine the harder "composite material" claimed by Applicant and taught by '252 and '281, for the purposes of maintaining a maximum cutting life of the tool (see pages 10-53 and 10-60), thus saving cost and also saving time by decreasing the amount of time that is spent changing tools.

14. Claims 11-14 and 16-18, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over either of U.S. Pat. No.'s 6,007,281 (Eriksson et al., hereinafter '281) or 5,641,252 (Eriksson et al., hereinafter, '252) in view of German Patent Document 19920365 A1 (hereinafter '365) and in view of the teachings of Tool and Manufacturing Engineers Handbook, Vol. 1, Machining, pp. 10-50 through 10-61 and 12-144.

Each of the above references teaches orbital machining of a blind-hole in a composite material utilizing a cylindrical tool smaller than the finished hole diameter.

For '281, see Figures 5-6, col. 8, lines 29-34, col. 4, lines 9-11, and particularly regarding claim 9, see col. 6, lines 31-33, for example.

For '252, see Figure 1C and col. 1, lines 14-35 and col. 4, lines 23-42, for example. Specifically regarding claim 18, see Figure 1D.

Each of '252 and '281, teaches all aspects of the claimed invention as described in the above rejection based thereon, but each of these references is silent as to how the workpiece is held for machining. Additionally, regarding claims 12-13, each of these references teaches machining a composite material, but does not specifically teach that the composite material is a "ceramic matrix composite material", nor that the composite material is a "silicon carbide/silicon carbide composite material". Also, each of these references is silent as to the particular rate of longitudinal advance of the cutter.

'365 teaches a holding device for a workpiece (see Figures 1-2, for example), wherein a thermosetting adhesive is used to affix the workpiece to a carrier, and where the workpiece is removed from the carrier upon completion of the machining (see abstract). Additionally, '365 teaches that such holding serves to hold a workpiece "precisely in registration on a carrier for machining or other precision operations, afterwards separating them", and further teaches that such holding "avoids all form of surface damage or impairment", see abstract, for example.

Also, as evidenced by the teachings of Tool and Manufacturing Engineers Handbook, Vol. 1, Machining, the longitudinal feed rate in a milling operation is selected based on a number of factors, such as the material being cut and the available power of the milling machine (see page 10-16, for example). Additionally, Tool and Manufacturing Engineers Handbook, Vol. 1, Machining teaches that in general "lower feeds are needed for cutting harder materials" (page 10-60), and provides various feed rates to try with various materials, see Table 10-8. Noting that all of the feed rates listed would create an advance of the tool wherein the tool is only advanced at most a few thousandths of an inch at a time, which would appear, as best understood, to create a hole that remains "substantially flat-bottomed" as cut.

Regarding the holding of the workpiece, therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the thermosetting adhesive device and method taught by '365 to hold the workpieces taught by either of '252 or '281 for the purposes of holding the workpieces precisely in registration, thereby increasing the machining accuracy, and for providing a holding technique that "avoids all form of surface damage or impairment", as taught by '365.

Additionally, regarding the workpiece material, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the composite material taught by each of the described references whatever type of composite material, such as "ceramic matrix" or "silicon carbide/silicon carbide" as was desired or expedient to an end user, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, particularly since Applicant has not ascribed any particular criticality to the use of a "ceramic matrix" composite, or to a "silicon carbide/silicon carbide" composite (see page 2, paragraph 6, which states that the "approach may be used with a wide variety of composite materials", for example). In re Leshin, 125 USPQ 416. See also Ballas Liquidating Co. v. Allied industries of Kansas, Inc. (DC Kans) 205 USPQ 331.

Also, regarding the feed rate of the tool, therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized one of the specific "lower feeds" taught by the teachings of Tool and Manufacturing Engineers Handbook, Vol. 1, Machining, to machine the harder "composite material" claimed by Applicant and taught by each of '252 and '281, for the purposes of maintaining a maximum cutting life of the tool (see

pages 10-53 and 10-60), thus saving cost and also saving time by decreasing the amount of time that is spent changing tools.

15. Claims 11-14, 16-17, and 19, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over any of U.S. Pat. No.'s 5,934,847 (Thelin, hereinafter, '847), 5,816,755 (Thelin, hereinafter '755), 5,641,252 (Eriksson et al., hereinafter '252), 5,685,674 (Taquist et al.), or WO 94/17944 (hereinafter '944) in view of German Patent Document 19920365 A1 (hereinafter '365) and in view of the teachings of Tool and Manufacturing Engineers Handbook, Vol. 1, Machining, pp. 10-50 through 10-61 and 12-144.

All of the above references teach orbital machining of a through-hole in a composite material utilizing a cylindrical tool smaller than the finished hole diameter.

For '847, see Figures 1A and 1B and col. 2, lines 13-15, for example.

For '755, see Figures 1A and 1B and col. 1, lines 31-33, for example.

For '252, see Figure 1C and col. 1, lines 14-35 and col. 4, lines 23-42, for example.

For Taquist et al., see Figure 3 and col. 1, lines 31-40 and col. 2, lines 58-62, for example.

Regarding '944, see page 1, lines 1-7, page 4, lines 24-26, page 7, lines 19-25, and Figures 1-3, for example.

Each of '847, '755, '252, Taquist et al., and '944 teaches all aspects of the claimed invention as described in the above rejection based thereon, but each of these references is silent as to how the workpiece is held for machining. Additionally, regarding claims 12-13, each of these references teaches machining a composite material, but does not specifically teach that the composite material is a "ceramic matrix composite material", nor that the composite material is a

"silicon carbide/silicon carbide composite material". Also, each of these references is silent as to the particular rate of longitudinal advance of the cutter.

'365 teaches a holding device for a workpiece (see Figures 1-2, for example), wherein a thermosetting adhesive is used to affix the workpiece to a carrier, and where the workpiece is removed from the carrier upon completion of the machining (see abstract). Additionally, '365 teaches that such holding serves to hold a workpiece "precisely in registration on a carrier for machining or other precision operations, afterwards separating them", and further teaches that such holding "avoids all form of surface damage or impairment", see abstract, for example.

Also, as evidenced by the teachings of Tool and Manufacturing Engineers Handbook, Vol. 1, Machining, the longitudinal feed rate in a milling operation is selected based on a number of factors, such as the material being cut and the available power of the milling machine (see page 10-16, for example). Additionally, Tool and Manufacturing Engineers Handbook, Vol. 1, Machining teaches that in general "lower feeds are needed for cutting harder materials" (page 10-60), and provides various feed rates to try with various materials, see Table 10-8. Noting that all of the feed rates listed would create an advance of the tool wherein the tool is only advanced at most a few thousandths of an inch at a time, which would appear, as best understood, to create a hole that remains "substantially flat-bottomed" as cut.

Regarding the holding of the workpiece, therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the thermosetting adhesive device and method taught by '365 to hold the workpieces taught by any of '847, '755, '252, Taquist et al., and '944 for the purposes of holding the workpieces precisely

in registration, thereby increasing the machining accuracy, and for providing a holding technique that "avoids all form of surface damage or impairment", as taught by '365.

Additionally, regarding the workpiece material, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the composite material taught by each of the described references whatever type of composite material, such as "ceramic matrix" or "silicon carbide/silicon carbide" as was desired or expedient to an end user, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, particularly since Applicant has not ascribed any particular criticality to the use of a "ceramic matrix" composite, or to a "silicon carbide/silicon carbide" composite (see page 2, paragraph 6, which states that the "approach may be used with a wide variety of composite materials", for example). In re Leshin, 125 USPQ 416. See also Ballas Liquidating Co. v. Allied industries of Kansas, Inc. (DC Kans) 205 USPQ 331.

Also, regarding the feed rate of the tool, therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized one of the specific "lower feeds" taught by the teachings of Tool and Manufacturing Engineers Handbook, Vol. 1, Machining, to machine the harder "composite material" claimed by Applicant and taught by each of '847, '755, '252, Taquist et al., and '944, for the purposes of maintaining a maximum cutting life of the tool (see pages 10-53 and 10-60), thus saving cost and also saving time by decreasing the amount of time that is spent changing tools.

16. Claims 11-15, 17, and 19, as best understood rejected under 35 U.S.C. 103(a) as being unpatentable over WO 94/17944 (hereinafter '944) in view of U.S. Pat. No. 3,917,249

(Constantine) and in view of the teachings of Tool and Manufacturing Engineers Handbook, Vol. 1, Machining, pp. 10-50 through 10-61 and 12-144.

'944 teaches orbital machining of a through-hole in a composite material utilizing a cylindrical tool smaller than the finished hole diameter. See page 1, lines 1-7, page 4, lines 24-26, page 7, lines 19-25, and Figures 1-3, for example.

'944 teaches all aspects of the claimed invention as described in the above rejection based thereon, but each of these references is silent as to how the workpiece is held for machining. Additionally, regarding claims 12-13, '944 teaches machining a composite material, but does not specifically teach that the composite material is a "ceramic matrix composite material", nor that the composite material is a "silicon carbide/silicon carbide composite material". Also, '944 is silent as to the particular rate of longitudinal advance of the cutter.

Constantine teaches machining of a complex workpiece 18 (Figures 1 and 16-17, col. 3, lines 10-19) wherein the workpiece is mounted in place for machining by an epoxy resin (adhesive) in order to achieve rigid mounting (col. 3, lines 10-19). The workpiece is supported by "non-planar backing fixtures" or support members 210 that are conformed to the shape of the under-side of the workpiece (Figures 16-17 and 21-22, and the adhesive 242 or 244 is placed on the support members 210 to mount the workpiece thereon (Figures 16-17, 21-22, for example).

Also, as evidenced by the teachings of Tool and Manufacturing Engineers Handbook, Vol. 1, Machining, the longitudinal feed rate in a milling operation is selected based on a number of factors, such as the material being cut and the available power of the milling machine (see page 10-16, for example). Additionally, Tool and Manufacturing Engineers Handbook, Vol. 1, Machining teaches that in general "lower feeds are needed for cutting harder materials" (page

10-60), and provides various feed rates to try with various materials, see Table 10-8. Noting that all of the feed rates listed would create an advance of the tool wherein the tool is only advanced at most a few thousandths of an inch at a time, which would appear, as best understood, to create a hole that remains "substantially flat-bottomed" as cut.

Regarding the holding of the workpiece, therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the adhesive and non-planar backing fixture that conforms to the workpiece concept taught by Constantine to hold the non-planar workpiece '944 (see Figures 1-3) for the purpose providing a rigid way of holding the workpiece taught by '944 (as taught by Constantine, see col. 3, lines 10-19), thereby increasing the machining accuracy of '944's device.

Additionally, regarding the workpiece material, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the composite material taught by each of the described references whatever type of composite material, such as "ceramic matrix" or "silicon carbide/silicon carbide" as was desired or expedient to an end user, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, particularly since Applicant has not ascribed any particular criticality to the use of a "ceramic matrix" composite, or to a "silicon carbide/silicon carbide" composite (see page 2, paragraph 6, which states that the "approach may be used with a wide variety of composite materials", for example). In re Leshin, 125 USPQ 416. See also Ballas Liquidating Co. v. Allied industries of Kansas, Inc. (DC Kans) 205 USPQ 331.

Also, regarding the feed rate of the tool, therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized one of the specific "lower feeds" taught by the teachings of Tool and Manufacturing Engineers Handbook, Vol. 1, Machining, to machine the harder "composite material" claimed by Applicant and taught by '944, for the purposes of maintaining a maximum cutting life of the tool (see pages 10-53 and 10-60), thus saving cost and also saving time by decreasing the amount of time that is spent changing tools.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Faxing of Responses to Office Actions and Contact Information

18. In order to reduce pendency and avoid potential delays, TC 3700 is encouraging FAXing of responses to Office Actions directly into the Group at (703) 872-9302 or, for responses after final rejection only, to (703) 872-9303. This practice may be used for filing papers not requiring a fee. It may also be used for filing papers which require a fee by applicants who authorize charges to a PTO deposit account. Please identify the examiner and art unit at the top of your cover sheet. Papers submitted via FAX into TC 3700 will be promptly forwarded to the examiner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erica Cadugan whose telephone number is (703) 308-6395. The examiner can normally be reached on Monday through Thursday from 7:30 a.m. to 5:00 p.m., and every other Friday from 7:30 a.m. to 4:00 p.m. If attempts to reach the examiner by

telephone are unsuccessful, the examiner's supervisor, A.L. Wellington can be reached at (703) 308-2159. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 3700 receptionist whose telephone number is (703) 308-1148.

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